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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/705,729	11/06/2000	Yoshinori Shizuno	OKI 267	7911

23995 7590 03/28/2003

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EXAMINER

FARAHANI, DANA

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 03/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application

09/705,729

Applicant(s)

SHIZUNO, YOSHINORI

Examiner

Dana Farahani

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/19/02 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Marrs et al., hereinafter Marrs (U.S. Patent 5,583,378).

Marrs discloses in figure 2A, a semiconductor device comprising a semiconductor device comprising a semiconductor chip 202; metal thin wires 222 are respectively connected to electrodes on the semiconductor chip; a wiring board 214 having an opening for accommodating the semiconductor chip and the board is connected to the chip by the wires; a heat spreader 204 having a flat principle surface, and having the chip and the wiring board on the surface; a common adhesive layer 210 which is provided over the principle surface of the heat spreader and bonds both the chip and the wiring board to the heat spreader; and an encapsulating resin 226 sealing the metal thin wires, wherein the chip is disposed in the opening of the wiring board, and is separated from the edges of the wiring board that collectively define the opening by a space so that the chip does not completely cover the heat spreader with the opening, and a portion of the heat spreader within the opening that is not covered by the chip is covered by the adhesive layer.

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3. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marrs, as applied to claim 1 above, and further in view of Yamagata et al., hereinafter Yamagata (U.S. 5,828,127), previously cited.

Marrs discloses the claimed invention except for a second adhesive layer and a radiating fin.

Yamagata discloses in figure 13, adhesive 20 and fin 19 to improve heat releasing capability (see column 19, lines 31-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use this structure in Marrs invention in order to further improve heat dissipation capability in the device of Marrs invention, and further use a second adhesive layer as the material for the layer 230A of Marrs structure, with the same thermal characteristic as the first adhesive layer, since the adhesive would have been readily available (it was used to form the first adhesive layer).

4. Claims 5-7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marrs in view of Yamagata, as applied to claim 2 above, and further in view of Shin (U.S. Patent 5,807,768), previously cited.

Regarding claims 5-7, Yamagata, as applied to Marrs, renders obvious the claimed invention, as discussed above, Marrs further disclosing in figure 2K a second adhesive 206, which is encapsulated with resin 226. However, Marrs does not disclose sealing the metal thin wires with a second different encapsulating resin after a first encapsulating resin, which seals the chip, has been cured.

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Shin discloses in figure 2 a first encapsulate 6a, and a second encapsulate 7a, sealing the metal wires, are provided for the chip package in the figure. Furthermore, Shin discloses the first encapsulate is cured before the second one is added (see column 10, lines 29-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use two encapsulates in order to attach the chip to the heat sink firmly, with a first stronger encapsulate than the second encapsulate to be disposed on the wires, without affecting the wires.

Regarding claim 10, in Shin, wires 5 are attached prior to the first sealing (see column 5, lines 6-18). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to attach wires prior the encapsulating the chip, so the wires would have conveniently and easily attached to the bare surface of the chip and then would have remained in a fixed position by the encapsulant applied on them.

Allowable Subject Matter

5. Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is an examiner's statement of reasons for allowance:

The primary reason for the indication of allowability of claim 9, is the inclusion therein of the limitation that the connecting electrodes is performed after the sealing the chip with a first incapsulant and before the sealing with a second incapsulant.

Response to Arguments

7. Applicant's arguments with respect to the rejected claims in the previous Office Action have been considered but are moot in view of the new grounds of rejection.

Briefly reciting, applicant argues that the previously applied references do not teach, nor disclose, a common adhesive layer (to the chip and the heat spreader). Note that this limitation is found in the newly cited reference, Marrs. Also, the limitation in claims 5 and 7, namely, the semiconductor chip is surrounded by the wiring board is found in the newly cited reference, Marrs.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703)308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

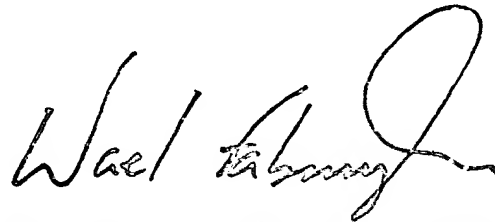
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Dana Farahani

March 22, 2003

A handwritten signature in black ink, appearing to read "Wael Labany". The signature is fluid and cursive, with a large loop at the end.

SUPERVISORY PRIMARY EXAMINER
TECHNOLOGY CENTER 2800